

PLS OPERATING MANUAL

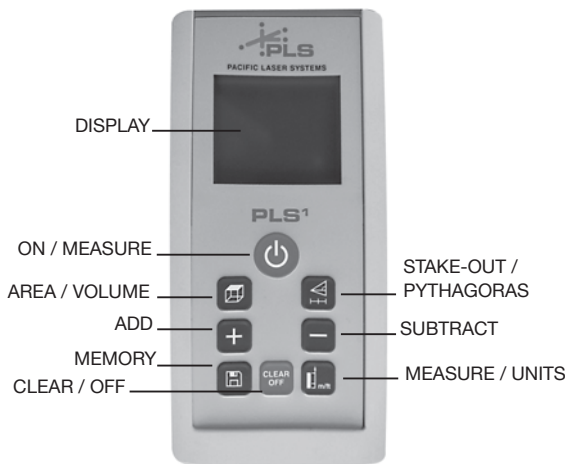
PLS1



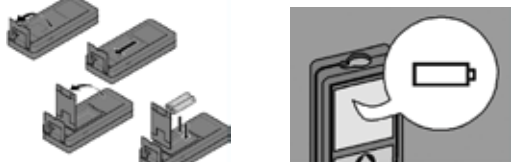
PACIFIC LASER SYSTEMS

The Professional Standard

FEATURES

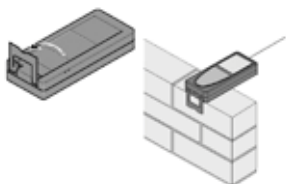


INSERT BATTERIES



To ensure a reliable use, do not use zinc-carbon batteries. Change batteries when battery symbol is flashing.

MULTIFUNCTIONAL ENDPIECE



The orientation of the endpiece is automatically detected and the zero point is accordingly adjusted.

MENU SWITCH



DISTANCE UNIT SETTING



Switch between the following units:

0.0000m	0.00 ft.
0.000m	0.00 1/32
0.00m	0.00 in.
	0 1/32

KEY



DESCRIPTION

Short Key press: Switch on / Laser on / Measure



1x press = add + / increase
1x press = subtract - /decrease



1x key press = area
2x key press = volume



1x press = stake out only with 1 value
2x press = Pythagoras 1
3x press = Pythagoras 2
4x press = Pythagoras 3



default = measure from back of device
1x press = measure from front
2x press = measure from tripod screw => (tripod symbol)

Measure from endpiece is automatically detected
Press for 2sec to change unit



1x press = memory of 10 displays
press this key for 2sec = take main value for further calculations



1x press = step back or clear last value
2x press = clear all

as usual - press for 2sec to turn off

SAFETY INSTRUCTIONS

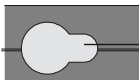
ELECTROMAGNETIC COMPATIBILITY (EMC)

WARNING

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

LASER CLASSIFICATION

The device produces visible laser beams which are emitted from the instrument: It is a Class 2 laser product in accordance with:
• IEC60825-1 : 2007 Radiation safety of laser products“



Laser Class 2 products:

Do not stare into the laser beam or direct it towards other people unnecessarily. Eye protection is normally afforded by aversion responses including the blink reflex.

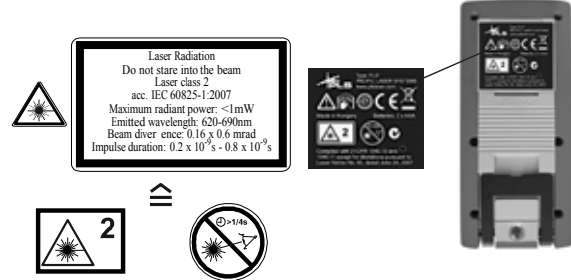
WARNING

Looking directly into the beam with optical aids (e.g. binoculars, telescopes) can be hazardous.

CAUTION

Looking into the laser beam may be hazardous to the eyes.

LABELLING



Subject to change (drawings, descriptions and technical data) without prior notice.

SAFETY INSTRUCTIONS

The person responsible for the instrument must ensure that all users understand these directions and adhere to them.

Areas of responsibility

Responsibilities of the manufacturer of the original equipment:

PLS · Pacific Laser Systems
2500 Kerner Blvd.
San Rafael, CA 949401

The company above is responsible for supplying the product, including the User Manual in a completely safe condition. The company above is not responsible for third party accessories.

Responsibilities of the person in charge of the instrument:

- To understand the safety instructions on the product and the instructions in the User Manual.
- To be familiar with local safety regulations relating to accident prevention.
- Always prevent access to the product by unauthorized personnel

Permitted use

- Measuring distances
- Tilt measurement

Prohibited use

- Using the product without instruction
- Using outside the stated limits
- Deactivation of safety systems and removal of explanatory and hazard labels
- Opening of the equipment by using tools (screwdrivers, etc.)
- Carrying out modification or conversion of the product
- Use of accessories from other manufacturers without express approval
- Deliberate dazzling of third parties; also in the dark
- Inadequate safeguards at the surveying site (e.g. when measuring on roads, construction sites, etc.)
- Deliberate or irresponsible behavior on scaffolding, when using ladders, when measuring near machines which are running or near parts of machines or installations which are unprotected
- Aiming directly in the sun

SAFETY INSTRUCTIONS

Hazards in use

WARNING

Watch out for erroneous measurements if the instrument is defective or if it has been dropped or has been misused or modified. Carry out periodic test measurements, particularly after the instrument has been subject to abnormal use, and before, during and after important measurements.

CAUTION

Never attempt to repair the product yourself. In case of damage, contact a local dealer.

WARNING

Changes or modifications not expressly approved could void the user's authority to operate the equipment.

Limits of use

Refer to section "Technical data". The device is designed for use in areas permanently habitable by humans. Do not use the product in explosion hazardous areas or in aggressive environments.

Disposal

CAUTION

Flat batteries must not be disposed of with household waste. Care for the environment and take them to the collection points provided in accordance with national or local regulations. The product must not be disposed with household waste. Dispose of the product appropriately in accordance with the national regulations in force in your country. Adhere to the national and country specific regulations. Product specific treatment and waste management can be downloaded from our homepage.



MESSAGE CODES

If the message Error does not disappear after switching on the device repeatedly, contact the dealer. If the message InFo appears with a number, press the Clear button and observe the following instructions:

	Cause	Correction
204	Calculation error	Perform measurement again.
252	Temperature too high	Let device cool down.
253	Temperature too low	Warm device up.
255	Received signal too weak, measuring time too long	Change target surface (e.g. white paper).
256	Received signal too high	Change target surface (e.g. white paper).
257	Too much back-ground light	Shadow target area.
258	Measurement outside of measuring range	Correct range.
260	Laser beam interrupted	Repeat measurement.

CARE

- Clean the device with a damp, soft cloth.
- Never immerse the device in water.
- Never use aggressive cleaning agents or solvents.

TECHNICAL DATA

Distance measurement	
Typical Range*	0.05-80 m / 2-265 ft
Range at unfavourable condition ***	60 m / 197 ft
Measuring Accuracy **	+/- 1.5 mm / 1/16 in
General	
Laser class	2
Laser type	635 nm, < 1 mW
Protection class	IP54 (dust- and splash water
Autom. laser switch off	after 90 seconds
Autom. power switch-off	after 180 seconds
Battery durability (2 x AAA)	up to 3000 measurements
Dimension (H x D x W)	120 x 58 x 29 mm (4.7 x 2.3 x 1.2 in)
Weight (with batteries)	146 g / 4.98 oz
Temperature range:	
- Storage	-25 to 70 °C -13 to 158 °F
- Operation	-10 to 50 °C 14 to 122 °F

TECHNICAL DATA

Functions	
Distance measuring	yes
Min/Max measuring	yes
Permanent measuring	yes
Stake-out	yes
Addition/Subtraction	yes
Area	yes
Volume	yes
Pythagoras	3-point, partial height
Memory	10 displays
Beep	yes
Illuminated display	yes
Multifunctional endpiece	yes

* applies for 100 % target reflectivity (white painted wall), low background illumination, 25 °C

** Tolerances apply from 0.05 m to 10 m with a confidence level of 95%. The maximum tolerance may deteriorate to 0.1 mm/m between 10 m to 30 m and to 0.20 mm/m for distances above 30 m

*** applies for 100 % target reflectivity, background illumination of approximately 30'000 lux

For accurate indirect results, the use of a tripod is recommended. For accurate tilt measurements a transverse tilt should be avoided.


Target surfaces: Measuring errors can occur when measuring to colorless liquids, glass, styrofoam or semi-permeable surfaces or when aiming at high gloss surfaces. Against dark surfaces the measuring time increases.

WARRANTY


This product is warranted by PLS · Pacific Laser Systems to the original purchaser to be free from defects in material and workmanship under normal use for a period of two year from the date of purchase. During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with the same or similar model at our option), without charge for either parts or labor, through PLS. The purchaser shall bear all shipping, packing and insurance costs. Upon completion of the repair or replacement, the unit will be returned to the customer, freight prepaid. The warranty will not apply to this product if it has been misused, abused or altered. Without limiting the foregoing, battery leakage, dents or gouges to the plastic housing, broken optic windows, damage to the switch/LED membrane are presumed to result from misuse or abuse. Tampering with or removal of the caution or certification labels voids this warranty.

Neither this warranty nor any other warranty, express or implied, including implied warranties of merchantability, shall extend beyond the warranty period. No responsibility is assumed for any incidental or consequential damages. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

SWITCHING ON/OFF




ON



OFF

Press ON button 2 sec to start continuous laser mode.



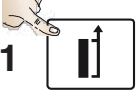
CLEAR OFF

2 sec

Device is turned OFF.


ADJUSTING MEASURING REFERENCE / TRIPOD

1




Distance is measured from the front of the device.

2



Distance is measured from the tripod thread permanently.


3



Distance is measured from the rear of the device (standard setting).



BEEP ON/OFF







2 sec simultaneously

ILLUMINATION ON/OFF






2 sec simultaneously

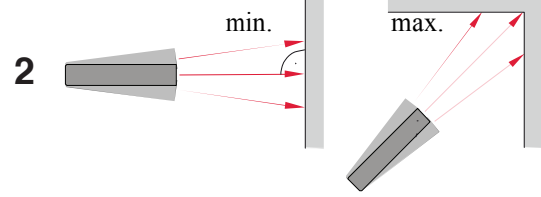
PERMANENT / MINIMUM-MAXIMUM MEASURING

1



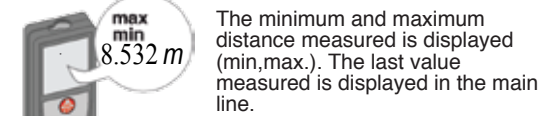
2 sec

2



min. max.


Used to measure room diagonals (maximum values) or horizontal distance (minimum values)



max min 8.532 m

The minimum and maximum distance measured is displayed (min,max.). The last value measured is displayed in the main line.


3




Stops permanent / minimum- maximum measuring.

MEMORY (10 LAST DISPLAYS)

1

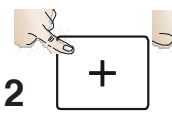


10 last displays are displayed.




!_10 8.294 m


2



+



-




2 sec

Navigates through 10 last displays.

The value from the main line can be used for further calculations.

CLEAR


1x



CLEAR OFF

Undo last action.

2x




CLEAR OFF


Leave actual function, go to default operation mode

ADD / SUBTRACT

1




2



+

3



-

The next measurement is added to the previous one.


The next measurement is subtracted from the previous one.

7.332 m 12.847 m


The result is shown in the main line and the measured value above. This process can be repeated as required. The same process can be used for adding or subtracting areas or volumes.

MEASURING SINGLE DISTANCE


1



2



3




Aim active laser target.

8.532 m

DELETE MEMORY

3




CLEAR OFF



2 sec simultaneously

Memory is completely deleted.

MESSAGE CODE




inFo 256

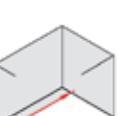
If the message :inFo" appears with a number, observe the instructions in section "message Codes". Example at left.

AREA


1



2




3




Aim laser at first target point.

4



5




The result is shown in the main line and the measured value above. Partial Measurements: Press + or - after starting the first measurement. Measure and add or subtract distances. Finish with DIST. Measure 2nd length.

24.352 m


Press 2 sec AREA / VOLUME key to get 2nd results.

VOLUME


1



2

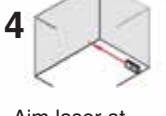


3




Aim laser at first target point..

4




5




Aim laser at second target point..

6



7




The result is shown in the main line and the measured value above.

78.694 m


Press 2 sec AREA / VOLUME key to get 2nd results.

PYTHAGORAS (3-POINT)


1



2




3




Aim laser at upper point.


4



5




6



Aim laser at rectangular point

Aim laser at lower point.

7




The result is shown in the main line and the measured distance above.

8.294 m


Pressing the measuring key for 2 sec in the function activates automatically Minimum or Maximum measurement.

PYTHAGORAS (PARTIAL HEIGHT)


1



2




3




Aim Laser at upper point.


4



5




6



Aim laser at 2nd point.

Aim laser at rectangular point.

7



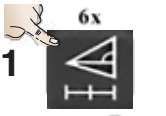
The result is shown in the main line and the measured distance above.

2.602 m


Pressing the measuring key for 2 sec in the function activates automatically Minimum or Maximum measurement.

STAKE OUT

1



2




Adjust Value

1.000m


0.625m

3



Approve value and start measurement.

4



Move device slowly along the stake-out line. The distance to the next stake-out point is displayed.

0.625m

When approaching a stake out point to less than 0.1 m the instrument starts to beep. The function can be stopped by pressing the CLEAR/OFF button.